DOCUMENT RESUME

ED 238 509 JC 840 043

AUTHOR Brower, Mary Jo
TITLE The Impact of Computer Assisted Instruction As It Relates to Learning Disabled Adults in California Community Colleges.
PUB DATE 31 Aug 83
NOTE 52p.; Bachelor's Thesis, University of San Francisco.
PUB TYPE Dissertations/Theses - Undetermined (040) -- Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Community Colleges; *Computer Assisted Instruction; *Learning Disabilities; Publicity; Questionnaires; State Surveys; *Teacher Attitudes; Two Year Colleges; *Two Year College Students
IDENTIFIERS *California

ABSTRACT

A study was conducted to determine the advantages and disadvantages of using computer-assisted instruction (CAI) with learning disabled (LD) adults attending California community colleges. A questionnaire survey of the directors of the LD programs solicited information on the availability of CAI for LD adults, methods of course advertisement, courses offered, and attitudes toward the approach. Survey findings, based on responses from all 107 community colleges, included the following: (1) 17% of the institutions offered classes specifically designed to enhance the education of LD adults using computers, and another 21% planned to implement such programs; (2) only three colleges selected LD adults to serve on advisory committees on computer use; (3) 72% of the colleges offering CAI did not send out materials advertising their courses, and 28% of these institutions changed the classroom environment; (4) 94% of the institutions offering CAI indicated that both students and staff were reacting favorably to the computer; (5) advantages of using CAI with LD adults were seen as enabling students to work at their own pace in a non-competitive environment, familiarizing LD students with the computer, providing instant reinforcement, and increasing motivation; and (6) disadvantages of using CAI with this group were seen as the lack of appropriate software and the frustration LD students may feel regarding CAI directions. The questionnaire is appended. (LAL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED238509

RESEARCH PROJECT THESIS

THE IMPACT OF COMPUTER ASSISTED INSTRUCTION AS IT RELATES TO LEARNING DISABLED ADULTS IN CALIFORNIA COMMUNITY COLLEGES

A thesis submitted to the faculty of
the University of San Francisco in
partial fulfillment of the requirement
for the degree of:

Bachelor of Science
Human Relations and Organizational Behavior

By

Mary Jo Brower

August 31, 1983

H-539

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

M. J. Brower

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

✓ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

VC 840 043

TABLE OF CONTENTS

CHAPTER I	PAGE
Introduction	1
Statement of the Problem	2
Definition of Terms	4
Variables	6
Significance of the Study	7
Limitations of the Study	8
CHAPTER II	
Review of Related Literature	9
CHAPTER III	
Methodology	16
CHAPTER IV	
Historical Account	19
Project Results	19
Table I	23
Table II	25
Table III	26
Table IV	27
Table V	29
Table VI	30
CHAPTER V	
Conclusions	35
Recommendations	37
REFERENCES	38
APPENDIXES	
A. COPY OF COVER LETTER AND FINAL QUESTIONNAIRE	40
B. LIST OF COLLEGES PARTICIPATING IN THE STUDY	44

Chapter I

Introduction

The California Community College has earned a reputation throughout the nation for providing quality education. According to the Final Report for Post-Secondary Alternatives to Meet Educational Needs of California's Adults (1975):

> California's 100 Community Colleges --two of which opened this year--account for nearly 30 percent of the state's postsecondary enrollments and for several times more state support than the adults schools. In 1973-74, their current expense budgets from all sources came to $687,810; 45 percent of which stemmed from state revenues.[1]

Much of this success has been the direct result of the new populations and communities that have been served. De Anza College in Cupertino started its Educational Diagnostic Clinic in 1973, which was created to assist and help remediate the specific learning disabilities of learning disabled adults. De Anza was the "Father" of learning disability programs for adults in the State of California, and has received nationwide recognition for the quality of educational assistance to its learning disabled students, and for the excellence of its highly qualified and diversified staff.

---

[1]Richard E. Peterson, et al., Final Report, "Post-secondary Alternatives to Meet the Educational Needs of California's Adults", Assembly Publications, Sacramento, September 1975, P. 38.

It is not an easy task to remain at the forefront of any educational program. De Anza has attempted to change with the times and include computer assisted instruction in its curriculum with learning disabled adults. The researcher is able to see that De Anza has implemented a major change in its curriculum by the addition of computers, but wonders what the statewide status of computer assisted instruction in learning disabilities programs is.

STATEMENT OF THE PROBLEM

The learning disabled adult population is increasing as both a legitimate source of economic support and political pressure in California. As such, there exists a need to fill the research gaps in the area of learning Disabilities education by the California Community Colleges.

The purpose of this study is to determine the impact of the use of computer assisted instruction as it relates to learning disabled adults in California Community Colleges. Specifically, to determine the advantages and disadvantages of computer assisted instruction with LD adults in these institutions.

Examination of computer usage and its relationship with the remediation of learning disabilities has so far been relegated to a basic "bank of information" to be used in helping to remediate LD problems. It is a fairly new concept, that has been acquired in the last few years, to actually use "hands on" experiences with computer programs

that are specifically designed for usage with the learning disabled adult as its focal point.

A system that currently is growing in popularity is the Computer Based Resource Units (CBRU), that is a service of the New York State Network of Special Education Instructional Materials Center.[2] This system utilizes the notion that information that is available from one instructor, no matter how useful, is limited due to the lack of expansive and collective knowledge in one's own area of expertise. Therefore, a data bank that is accessible to numbers of instructors, could house the combined knowledge and experiences that they have acquired; and could then be easily drawn upon for a source of problem solving, and case comparison.

This system is available in many of the Eastern United States, but has not, as of this writing, been made available for the Western United States.

This data bank would match and compare: age, sex, specific learning disability, and associated problems that the student has experienced. Attempted modes of remediation, counseling and available materials would be placed in the data bank and matched up to the information that was given to the computer. This method is more of a computer-based resource guide, than an instrument to actually assist the learning disabled adult with remediating his/her own

---

[2]B.R. Gearheart, Learning Disabilities - Educational Strategies, The C.V. Mosby Company, Saint Louis, Missouri, 1973, Pg. 138.

problems by direct usage of the computer.

The objectives of this research project are:

(1) To complete a State of the Art study of computer assisted instruction as it pertains to learning disabled adults,

(2) To determine the above stated use of computers, and

(3) To determine the extent of their usage, development and advantages and disadvantages.

DEFINITION OF TERMS

The following terms will be used throughout this research project:

California Community Colleges:

Any of the 107 recognized Community College systems in the State of California.

Computer Assisted Instruction, which may be referred to as CAI:

Programs specifically designed to meet the needs of learning disabled adults, to be used with an established computer system, for the hands-on experience of the learning disabled adult.

Learning Disability:

Learning disability refers to students with exceptional learning needs who have neurological, biochemical, or developmental limitations. These limitations result from atypical

perception, cognition, or response to environmental stimuli, manifested by inadequate ability to manipulate educational symbols in an expected manner. Typical limitations include inadequate ability to listen, speak, read, write, spell, concentrate, remember or do computation. Specific learning disabilities are frequently due to constitutional, genetic, or neurological factors. Specific learning disabilities include dyslexia, dyscalculia, dysgraphia, agnosia, and dysphasia. These students demonstrate a significant discropancy between their achievement and potential levels because of one or more of the following:

a. Neurological limitation refers to the exceptional learning needs of a student with average academic potential.
b. Biochemical limitation refers to the exceptional learning needs of a student with average academic potential.
c. Developmental limitation refers to the exceptional learning needs of students who may or may not possess average academic potential.[3]

Specific Learning Disability:

Specific learning disabilities are disorders in which the individual's ability to process language, read, spell, and/or calculate is significantly below expectance as

---

[3]Authority cited: Title V Regulations, Sec. 56024

measured by departmentally recognized diagnostic procedures despite conventional instruction, adequate intelligence, and socio-cultural opportunity. Specific learning disabilities are frequently due to constitutional, genetic, or neurological factors. Specific learning disabilities include dyslexia, dyscalculia, dysgraphia, agnosia, and dyspasis.

Limitations caused by special learning disabilities must impair educational or vocational progress to be considered vocationally handicapping.

Learning problems due primarily to mental retardation, emotional, visual, hearing, or other readily identified medical problems, or those resulting from maturational lag, socio-cultural disadvantage or behavior problems are not to be interpreted as learning disabilities qualifying for Department of Rehabilitation eligibility under this definition.[4]

VARIABLES

The use of computer assisted technology with learning disabled adults is the dependent variable in this study, because that is the area (variable) that is being studied and measured by this survey. The independent variables are the number of colleges that do/do not use computer assisted learning technology, and the number of colleges that do not respond to the questionnaire.

---

[4] Ibid

SIGNIFICANCE OF THE STUDY

Although research is increasing daily in computer assisted instruction as it relates to learning disabled adults in California Community Colleges, much still remains to be done to pull the relevant information on curriculum and methodology together.

This information will be of use to the 107 California Community Colleges in their endeavor to update knowledge on the current conditions of computer assisted instruction in learning disabilities programs.

The researcher was able to find many references to computer use with learning disabled children, however, information regarding learning disabled adults was found to be scarce.

This study assumes that colleges need periodic evaluations of their programs to determine whether the above mentioned curriculum and methodolgy serve the purpose for which they were intended in educating the learning disabled adult. With respect to the California Community Colleges, this study will compare and contrast the following information:

(1) What courses and programs are offered with computer assistance to learning disabled adults?

(2) What classes are most commonly offered?

(3) What are the advantages and disadvantages of CAI?

(4) Under what environmental conditions have the classes been offered?

(5) What experiences and advice do staff have for the college?

(6) Has there been a significant over-all growth or decrease of interest in computer assisted learning with L.D. adults in California Community Colleges?

LIMITATIONS OF THE STUDY

The limitations of the study pertain to that are current trends in today's field of education in regards to how favorably California Community Colleges react to the assumed need for computer assisted learning with L.D. adults.

This is not a study to determine the effectiveness of CAI, but to examine its usage, advantages and disadvantages.

My hypothesis is that the need for computer assisted instruction with L.D. adults will be shown to have significantly favorable results in relationship with acceptance by the community colleges, instructors and students. It will reflect itself in measurable terms of reduction in staff needed; confidence of the community colleges in increasing their course content and offering, and in favorable responses from the questionnaire to be used.

Additional limitations of the study which will be conducted in the form of a questionnaire include:

> Two of these defects are possible, lack of response and the inability to check the responses given...Responses to mail questionnaires are generally poor. Returns of less than 40-50 percent are common. Higher percentages are rare. At best, the researcher must content himself with returns as los as 50-60 percent.[5]

---

[5]Fred N. Kerlinger, Foundations of Behavioral Research, New York: Holt, Rinehart and Winston, Inc., 1955, P. 397

CHAPTER 2

REVIEW OF RELATED LITERATURE

The major purpose of this chapter is to review the literature pertinent to the use of computer assisted instruction with learning disabled adults in California Community Colleges.

As previously stated, information on computer assisted instruction as related to learning disabled adults was scarce to find. However, the available information supported the researcher's premise of the "infancy" of computer assisted instruction in California Community Colleges, and also was important in validating the success so far, in the usage documented.

Finally, related literature will discuss the rationale for the use of a survey/questionnaire in this research project.

Cassidy-Bronson, Schiffman and Tobin state that,

> "Special educators must realize that computers are coming, whether or not schools jump on the bandwagon. Microcomputers, videodiscs, and/or tapes, when combined, have a virtually unlimited capacity to store information, to present it in lessons geared to student's abilities, and to test whether they have learned it."[6]

An opinion on the lack of use of computers in classrooms:

---

[6]Susan Cassidy-Bronson, Gilbert Schiffman, EdD., & Dianne Tobin. Personal Computers for the Learning Disabled - The State of the Art and the Problem. Journal of Learning Disabilities, Vol. 15, Number 7, August/September 1982, Pg. 422.

> "While talk of a 'computer revolution' has been common for more than twenty-five years, computers have barely entered the English classroom, much less revolutionized it. This is hardly surprising. Prior to 1975 almost all computing was done on huge 'mainframe' computers that required large support staffs and a collection of programmers that was practically a priesthood. With the introduction of Apple's microcomputer in 1977, however, things began to change. There were now computers small enough to be carried from room-to-room and simple enough to be operated and programmed by mere mortals. Computers began to come to the classroom-sometimes even the English class."[7]

Lack of financial assistance, as well as a natural fear of the unknown are also reasons that the so-called "computer revolution" has not been readily apparent in California Community Colleges.

> "Getting computers into the schools and keeping them there is still dependent on public acceptance of them...I have encountered too many dedicated and enthusiastic but naive computer specialists in schools who have no realization that public schools are political entities and as such have all of the flaws of human logic and emotion...The computer sections at state levels are new, and newness is not only suspect, but vulnerable under a seniority system. With federal money drying up and state-level departments (which try to funnel money to their specialties) becoming shaky, the local computer specialist or teacher-hoping-to-be-specialist is losing much needed support."[8]

Literature was available that supported the researcher's premise that computer assistance with learning disabled adults was a valuable tool in providing assistance with the students' remediation plan.

---

[7] William Wresch, Computers in English Class: Finally Beyond Grammar and Spelling Drills. College English, Vol. 44, Number 5, September 1982, Pg. 483.

[8] Harry N. Chandler, M.Ed., Tron, Taxpayers and Computers---Computers in the School. Journal of Learning Disabilities, Vol. 15, Number 8, October 1982, Pg. 495.

"Nowhere are the benefits of learning with personal computers more dramatic than with the handicapped whose physical, cognitive, and learning limitations have been a barrier to an education and a productive life. However, Kirk Wilson makes a valid point when he comments that the potential for computer-based education for handicapped students will not be reached until computers are as handy and usable as blackboards, telephones, and typewriters. Computers must be perceived by teachers and administrators as routine tools, rather than as sophisticated high technology."[9]

William Wresch attests that computer assisted instruction is valuable to learning disabled students:

"Working alone with a computer, remedial students are able to progress through spelling lists and grammar exercises with engagement and without pressure. By spending twenty or thirty minutes a day at the computer outside of class, many students who otherwise might not learn the basics do learn, and in fact are often pleased with the constant feedback that the computer gives them and the status among their peers that comes from working with a computer." [10]

Further literature supports the use of CAI:

"In the area of affective/motivational outcomes of Computer assisted instruction, the news is almost all good. At the college, high school and elementary school levels, students have good things to say about learning from computers. They also emerge with more positive attitudes about computers.

Students consistently report that they enjoy the ability to move at their own pace, as well as the lack of embarrassment about mistakes, ("You can learn at your own rate," and "There's no teacher to yell at you," are among things students said to researchers James Gershman and Evannah Sakamoto

---

[9]Susan Cassidy-Bronson, Gilbert Schiffman, EdD., and Dianne Tobin. Personal Computers for the Learning Disabled - The State of the Art and the Problem. Journal of Learning Disabilities, Vol. 15, Number 7, August/September 1982, p. 422.

[10]William Wresch. Computers in English Class: Finally Beyond Grammar and Spelling Drills. College English

in a 1980 study for the Ontario Institute for Studies in Education.)" [11]

"...A microcomputer is not only an excellent teaching tool, but is equally effective for drill and practice activities, reinforcement of previously presented instructional materials, testing, and program management. Furthermore, we discovered that the microcomputers are readily adapable to the various instructional formats we had already been using in our program. Software to supplement the tutorial, laboratory and small group instruction has been acquired gradually. We have learned that instructional software is available in the subject areas of reading, arithmetic, spelling, vocabulary, written expression, prevocational skills, and consumer and daily living skills."

"Our experience thus far has taught us that the microcomputer in the classroom is truly a versatile teaching tool, one that is particularly relevant in a highly individualized program. It adapts itself easily to a wide range of instructional materials and learning styles. A computer with standard hardward is ideal for the visual learned because of the strong emphasis on visual presentation of information. For individuals with deficits in visual-motor coordination, it is beneficial because it reduces the amount of time needed to formulate a complete and legible response. For students with physical impairments or mobility limitations, it allows for rapid and thorough responses with a minimum of manual dexterity and range of motion. For the student who learns at a faster or slower rate than average, the microcomputer is ideal because it is entirely self-paced."

"The adaptability and versatility of the microcomputer as a teaching tool in the classroom have proven to be most appropriate for non-traditional learners in an individualized program. We anticipate that increasingly sophisticated hardware and software options in the future will allow us to become more refined in our response to individual learning styles and needs."[12]

---

[11]Gerald W. Bracey. Computers in Education - What the Research Shows. Electonic Learning, November/December 1982.

[12]Laura C. Moyles & Jeanne Newell. Microcomputers in a Postsecondary Curriculum. Academic Therapy, 1982.

A final literature review in favor of computer assisted instruction:

"Moreover, CAI is comparatively inexpensive, and its cost is rapidly decreasing as micro-processors become more powerful and computer memory becomes cheaper. It is a tool which may be used by an instructor to supply individual instruction and thus a better quality of education to a larger number of persons."[13]

The survey/questionnaire method of gathering data has been well-established as a technique for obtaining information from a large source of participants. One hundred and seven California Community Colleges needed to be surveyed in this research project. Due to time, financial and logistical constraints, the interview technique was discarded as a practical approach.

The survey/questionnaire method was chosen because of its past successful use in college surveys such as (Sellitti, 1981; Fasteau, 1979; and Kirk, 1973), and from positive literature review support.

Sax (1968) lists four advantages in using the survey-questionnaire:

(1) Economy - there is little time and expense involved in training interviewees.

(2) Geography - the questionnaires can be sent almost anywhere.

(3) Number of participants - by sending out questionnaires, more persons can be contacted than would

---

[13]A. Brebner & H.J. Hallworth. Development of Computer Assisted Instruction at VRRI. Research, Demonstration & Practice, Ten Years of Progress. Published by the Vocational and Rehabilitation Research Institute, 1979, Pg. 91.

be possible through other techniques such as interviews.

(4) A standardized format - each respondent receives the same set of questions and instructions in exactly the same way. A well-structured questionnaire will increase the validity of the instrument.

Disadvantages in using the survey/questionnaire technique listed by Sax include:

(1) Motivating the respondent.

(2) The assumption that everyone receiving the questionnaire can read and write.

(3) Ensuring that a representative sample has been returned.[14]

According to Sellitti (1981), Fox (1969) has identified two major purposes for using the survey/questionnaire method in education. First, that there is an absence of information about a problem of educational significance, and second, that the situations which could generate that information do exist and are accessible to the researcher. Advantages for using the survey/questionnaire technique as identified by Sellitti are:

(1) Mass coverage

(2) Information can be achieved quickly and inexpensively

(3) Because of no interaction other than by written

---

[14]Gilbert Sax. Empirical Foundations of Educational Research. New Jersey:Prentice-Hall, Inc., 1968.

instructions, this technique insures maximum standardization.[15]

The disadvantages identified by Fox are:

(1) Often there is a very low return rate, seldom rising above 50 percent.

(2) Because of low return rates, the data obtained may not be representative of the population.[16]

The survey/questionnaire approach was chosen by the researcher because of the number of California Community Colleges that needed to be surveyed (107). The project was supported by De Anza Community College, so hopefully there would be a greater amount of interest sparked in the respondent's attitude to accurately complete the survey and to return the results to a peer group.

---

[15]Steven L. Sellitti, Ph.D., "A Study of Program Evaluation Procedures and Policies of Handicapped Programs and Services in California Community.Colleges." United States International University, 1981.

[16]David J. Fox. The Research Process In Education. San Francisco: Holt, Rinehart and Winston, Inc., 1969.

CHAPTER III

METHODOLOGY

This research project was designed to determine the impact of the use of computer assisted instruction as it relates to learning disabled adults in California Community Colleges, or specifically, to determine the advantages and disadvantages of computer assisted instruction in the above applications.

The research design used was a survey/questionnaire. This instrument was initially designed and adopted from another survey/questionnaire that was used previously by the site representative.

Once the survey/questionnaire was intact, it was distributed to a panel of three experts who were credentialled California Community College Learning Disabilities instructors. After reviewing the instrument, minor changes in format, more space for comments, grouping of like questions, and deleting some redundant terminology were suggested.

Once the suggested changes had occurred, the Dean of Special Studies and the panel of experts field-tested the survey-questionnaire and found it to be a valid instrument.

The three-page coded survey-questionnaire was to be sent to all of the directors of the Learning Disabilities Programs of the 107 California Community Colleges. By sending the survey to all of the community colleges in the state, the researcher thereby hopes to have a pure sampling of available information and up-to-date, state of the art research data.

Within two weeks, sixty surveys or a 56% return were received. This was not determined to be satisfactory, so the researcher identified the surveys still out by the code numbers, and telephoned each college to see if in fact they received the survey, or if it was sitting on someone's desk.

A second supply of surveys coded with the original number and the letter "B" were sent to those colleges. After three weeks, there was an additional return of 27 questionnaires, or an 80% rate of return.

Still not satisfied, the researcher again telephoned these colleges and completed twenty additional surveys for a total of 100% response.

Research costs in a survey/questionnaire are relatively small. Costs incurred were for printing, stationery, stamps and envelopes. Additional costs will be incurred in sending out results to those colleges that requested them.

Follow-up procedures to the initial distribution of the survey/questionnaire required additional stationery, etc., and a vigorous telephone inquiry as to why surveys were not returned, and the completion of some of the information via the telephone were anticipated costs.

The research design will be an analysis of the responses received from the survey/questionnaires. The first analysis to be conducted will be a descriptive analysis by counts of the response and percentage of response. There will also be a descriptive statistic analysis showing percentages and counts for all of the items.

A tally and reporting of the open-ended questions in the

survey will allow for comments to either agree or disagree with the researcher's hypothesis that computer assisted instruction is advantageous for learning disabled adults in California Community Colleges.

Copies of the results will be sent to all participants that requested same, as a means of incentive for completion of the questionnaire.

The researcher's anticipated findings are again that the use of computer assisted instruction with learning disabled adults in California Community Colleges will prove to be advantageous. The researcher also expects to find an increasing use and affinity for the computer and its related programs.

Funding is anticipated as being a major set-back in acquiring the computers, due to the lack of available monies since the passage of Proposition 13.

CHAPTER IV

HISTORICAL ACCOUNT

Use of computer assisted instruction with learning disabled adults in California Community Colleges had been taking place for the past few years. However, this usage was suspected of being sporatic and there was no feedback or hard data, as to the advantages and disadvantages of using CAI.

The researcher decided to embark upon filling in the research gaps in the area of CAI in learning disabilities education by these institutions.

PROJECT RESULTS

This chapter is a report of the data generated by the survey/questionnaire study. Not all information gathered is relevant to this study. De Anza Community College will also be using the information for their own purposes.

The seven questions in Table I pertain to responses concerning the availability of computer assisted instruction for learning disabled adults in California Community Colleges.

Table I shows that 18 out of 107 colleges, or 17% of the total California Community Colleges currently offer CAI, and that an additional 19 colleges are planning to institute CAI into their curriculum. That would be a total of 37 colleges or 35% of California Community Colleges that have or are planning on having CAI in their institutions.

Only three colleges specifically selected learning disabled adults for any advisory committees for the use of computers.

Table II is a histogram showing the relationship between different methods of course advertisement and the number of colleges that apply these methods.

Table II shows that 55 colleges or 51% of the total California Community Colleges advertise their course offerings to the public in a special manner. The three most used mehtods were: schedules, high-school recruiting of students and the newspaper.

The two questions in Table III are concerned with responses from those colleges currently offering computer assisted instruction for learning disabled adults, regarding advertisement and environment.

Seventy-two percent of the colleges offering CAI do not send out materials advertising their courses.

Twenty-eight percent of the colleges which have instituted CAI have changed the environment of the classroom. Examples of these changes included: changing the computer location to a non-threatening and non-distracting area; having the computers on an individual basis in a laboratory setting, and having the classroom set up informally.

Tables II and III are important to this study in the terms of attitudes toward informing the public about CAI, and in making the staff and students feel more comfortable and less threatened in the computerized classroom.

Table IV gives the breakdown of course offerings - current, past and future; enrollment; whether classes are graded or ungraded; the number of units offered, and

whether the class was held in a regular classroom or not.

Table V is a histogram depicting the subject areas in which CAI is offered and the number of colleges offering each subject.

Table VI indicates responses concerning assessment of attitudes towards computer assisted instruction.

It was felt by 94% of the colleges offering CAI, that both the students and staff are reacting favorably to the computer.

100% of the respondents expressed that they did in fact like the CAI courses for learning disabled adults. Some of the favorable reasons were listed as:

- They are able to work at their own pace in a non-competitive environment.
- They are able to learn to use the computers and become familiar with a very current and popular technological phenomenon.
- Instant reinforcement.
- "Machine novelty" increases motivation.
- Good for repetitive tasks.
- Saves tutor time and money.

Other reasons are listed in Table VI.

Fifty percent of the colleges also stated unfavorable reasons or disadvantages to having CAI. Some of these are:

- Lack of software to deal with remedial students on adult level.
- Computer programs are very specific in their directions, and this can be very frustrating for the student.
- Lack of really good software - educational software is really lagging behind software development. Much of what is seen is nothing more than a worksheet programmed onto a disc. There is a lack of creativity, challenge, and the magic of what CAI is possible of doing.

Other reasons are listed in Table VI.

It is significant to note that 17 out of 18 colleges, or 96%, felt that CAI needed to have individual tutoring along with it. There would have been 100% concensus on this question, except for one response in the N/A column. The reason given was because their program was so new, that they did not feel comfortable answering this question without further experience with the computers.

Reasons stated for needing tutors were:

- The quality of instructional software at this time is not advanced enough to be used to the exclusion of other modes and materials.
- Some students do not learn to use the computer effectively.
- Many students need the reinforcement of the personal contact from tutoring.

Eighty-nine percent of the respondents anticipated future investment in additional computers, but indicated a lack of funding as a major concern. Grants and donations were listed as being primary providers for the CAI hardware.

Seventy-two percent of the colleges offering CAI were not considering initiating fees for the courses. The 28% that did anticipate fees, ranged them from one to three dollars.

Additional comments and suggestions are listed in Table VI.

TABLE I

Responses to Questions Concerning the Availability of Computer Assisted Instruction for Learning Disabled Adults in California Community Colleges.

Questions	Frequency	Percent of Total Colleges
1. Does your college offer any classes or programs specifically to enhance the education of learning disabled adults using computers?	107	
Yes	18	17
No	89	83
2. Has your college offered, but discontinued in recent years, such classes or programs for learning disabled adults?	107	
Yes	1	1
No	105	98
N/A	1	1
3. Does your college have any classes or programs for learning disabled adults using computer assistance in the planning stage?	107	
Yes	19	21
No	70	65
*18 colleges were already identified as having CAI programs in place.		
4. Do you specifically select learning disabled adults for any advisory committee(s) for the use of computers?	107	
Yes	3	3
No	103	96
N/A	1	1

TABLE I - CONTINUED

Questions	Frequency	Percent of Total Colleges
5. Do you have any administrative personnel or advisory committee specifically working and planning for computer assisted instruction?	107	
Yes	34	32
No	73	68
6. Do you cooperate with any other agency in the offering of classes of programs for using computer assistance for learning disabled adults?	107	
Yes	6	6
No	101	94
Agencies:		
CAPED Micro Network (California Association of Postsecondary Educators of the Disabled)		
Valley Medical Center		
Palo Alto Veteran's Center		
7. What means do you use to reach your area residents? With a schedule of Classes or similar listing of your offerings?	107	
Mail Schedule	55	51
High School Recruiting	12	11
Newspaper	12	11
N/A	11	10
Letters Sent Home	4	4
Brochures	4	4
Radio	4	4
Liaison/Agencies	3	3
Visits to Program	3	3
Catalog	2	2
Newsletter	2	2
Television	2	2
On-Campus Recruitment	2	2
Posters	1	1

TABLE II

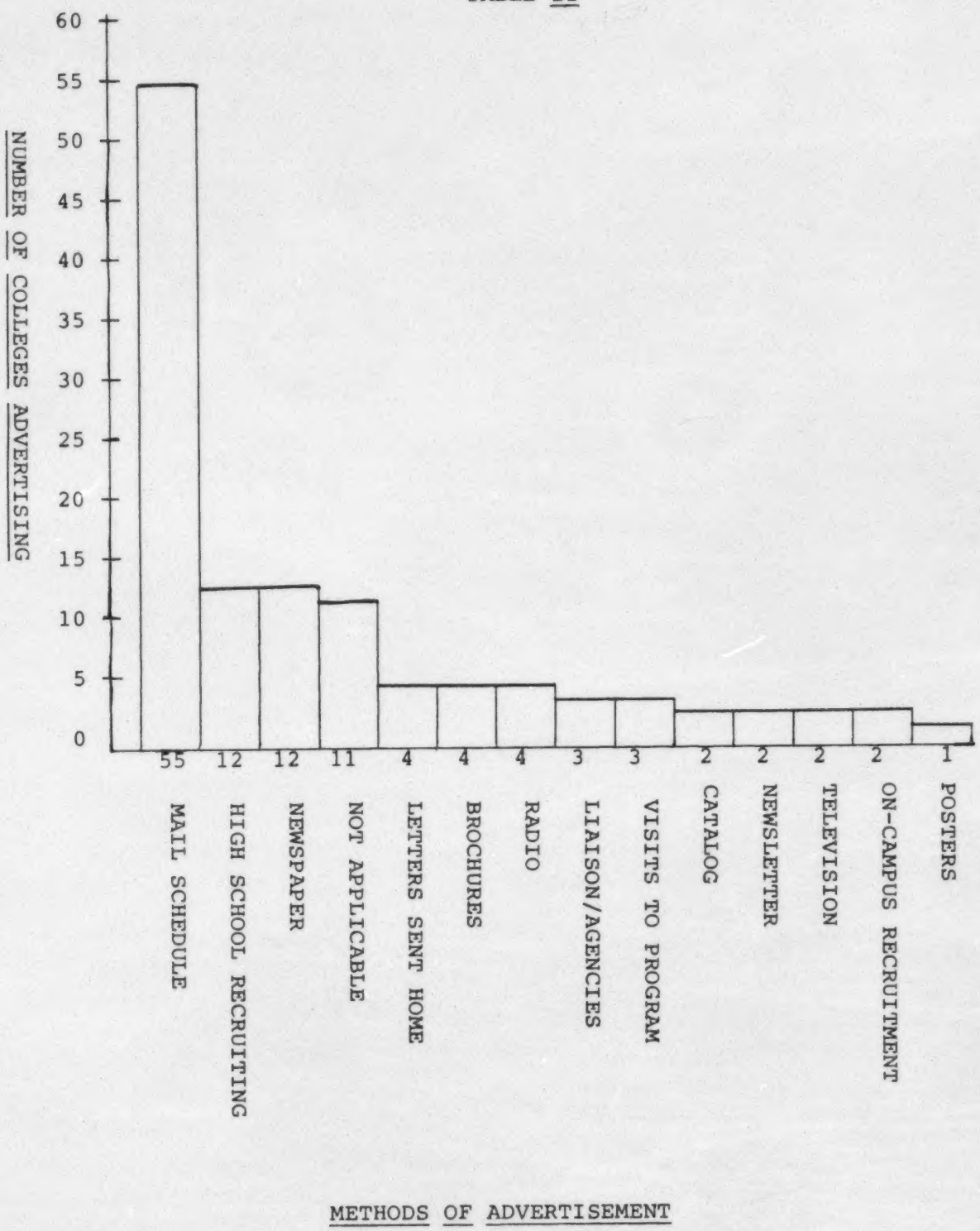
NUMBER OF COLLEGES ADVERTISING
60
55
50
45
40
35
30
25
20
15
10
5
0
55 MAIL SCHEDULE
12 HIGH SCHOOL RECRUITING
12 NEWSPAPER
11 NOT APPLICABLE
4 LETTERS SENT HOME
4 BROCHURES
4 RADIO
3 LIAISON/AGENCIES
3 VISITS TO PROGRAM
2 CATALOG
2 NEWSLETTER
2 TELEVISION
2 ON-CAMPUS RECRUITMENT
1 POSTERS
METHODS OF ADVERTISEMENT

TABLE III

Response From Those Colleges Currently Offering Computer Assisted Instruction for Learning Disabled Adults, Regarding Advertisement and Environment.

Questions	Frequency	Percent of Total Colleges
8. Have you ever sent, or do you now send materials advertising your offerings in computers or the use of computers to assist students in the learning process?	18	
Yes	5	28
No	13	72
9. In these classes which provide computer assisted learning, have you made any effort to change the classroom to anything more formal or informal?	18	
Yes	5	28
No	12	67
N/A	1	6

How?:

- Computer location changed to a non-threatening and non-distracting area.
- Individual basis in a lab setting
- Informal setting

27.

TABLE IV

COURSE	CURRENT OFF.	PAST OFF.	FUTURE OFF.	ENROLLMENT	GR/UN	UNITS	REG. CLASSROOM
Reading	Sp83	W83	F83	20	gr-P/F	1-3	yes
	Sp83	W83	F83	10	CR/NC	3	yes
	Sp83	W83	F83	16-21	Un	Adult Ed	No-Spec. Ed.Center
	Sp83	NR	NR	40	CR/NC	1-4	No-Spec. Ed.Center
	Sp83	NR	NR	NR	NR	NR	NR
	Sp83	W83	F83	2	Un	3	NR
	Sp83	W83	F83	60	CR/NC	1	No-Spec. Learning Center
	SP83	W83	F83	25	Un	0	No-Sp LC class
	Sp83	W83	F83	15	Gr/Un	2	NR
	Sp83	NR	F83	1-50	NR	.5 - 4	NR
	SP83	NR	F83	NR	Un	.5 - 1.5	NO-Tutoring
	Sp83	NR	F83	NR	NR	NR	NR
Spelling	Sp83	W83	F83	20	Gr-P/F	1-3	yes
	Sp83	W83	F83	10	Cr/NC	3	yes
	Sp83	NR	F83	40	CR/NC	1-4	No-Sp Ed Center
	Sp83	NR	NR	NR	NR	NR	NR
	Sp83	W83	F83	6	Un	3	NR
	Sp83	W83	F83	60	CR/NC	1	No-Sp Learning Center
	Sp83	W83	F83	25	Un	0	No-Sp lc class
	Sp83	W83	F83	NR	Un	NR	NR
	Sp83	W83	F83	15	Gr/Un	1	NR
	Sp83	NR	F83	1-50	NR	.5 - 4	NR
	Sp83	NR	F83	NR	GR	3	NR
	Sp83	NR	NR	NR	NR	NR	NR
Writing	Sp83	W83	F83	20	GR-P/F	2-4	Yes
	Sp83	NR	NR	NR	NR	NR	NR
	Sp83	W83	F83	2	Un	3	NR
	Sp83	W83	F83	25	Un	0	No-Sp Ed class
	Sp83	NR	F83	1-50	NR	.5 - 4	NR
	SP83	NR	F83	NR	GR	3	NR
	Sp83	NR	NR	NR	NR	NR	NR

28.

TABLE IV

COURSE	CURRENT OFF.	PAST OFF.	FUTURE OFF.	ENROLLMENT	GR/UN	UNITS	REG. CLASSROOM
MATH	Sp83	W83	F83	20	Gr-P/F	1-3	Yes
	Sp83	W83	F83	10	CR/NC	3	yes
	Sp83	NR	NR	40	CR/NC	1-4	No-SPED CENTER
	Sp83	NA	NA	15	GR	3	No
	Sp83	NR	NR	NR	NR	NR	NR
	Sp83	W83	F83	15	Un	3	NR
	Sp83	W83	F83	60	CR/NC	1	No-SPED Class
	Sp83	W83	F83	25	Un	0	No-Sped class
	Sp83	W83	F83	NR	Un	NR	NR
	Sp83	W83	F83	15	Gr/Un	1	NR
	Sp83	NR	F83	1-50	NR	.5 - 4	NR
	Sp83	NR	F83	NR	GR	3	NR
	Sp83	NR	NR	NR	NR	NR	NR
	Sp83	NR	F83	NR	Gr	1	yes
Ind. Rem.	Sp83	W83	F83	25-50	CR/NC	1-3	NR
	Sp83	NR	NR	40	CR/NC	1-4	No-SPED CENTER
	Sp83	NA	NA	13	Gr	1-3	No
	Sp83	W83	F83	30	Un	1.5 - 3	NR
	Sp83	W83	F83	60	CR/NC	1	No-SP LC CLASS
	Sp83	W83	F83	25	Un	0	No-Sp LC CLASS
	Sp83	NR	F83	NR	Un	.5 - 1.5	NR
	Sp83	NR	NR	NR	NR	NR	NR
	Sp83	NR	F83	NR	Un	0	LC Lab
Vocational Assessment	Sp83	W83	F83	20	Cr/NC	1	NR
	Sp 83	NR	NR	NR	NR	NR	NR
Study Skills I	Sp83	W83	F83	23	Gr	.5 - 2	NR
Study SkillsII	Sp83	W83	F83	36	Gr	.5 - 2	NR
Thinking Skills	Sp83	NR	F83	NR	Gr	3	NR
Learning Lab	Sp83	W83	F83	15	Gr/Un	.5 - 1.5	No-LC CLASS
Interpersonal Com.	Sp83	NR	NR	NR	NR	NR	NR
Cognitive Rehab.	Sp83	NR	NR	NR	NR	NR	NR
Intro to Comp Literacy	Sp83	NR	F83	5	Cr	1	Lc Lab

TABLE V

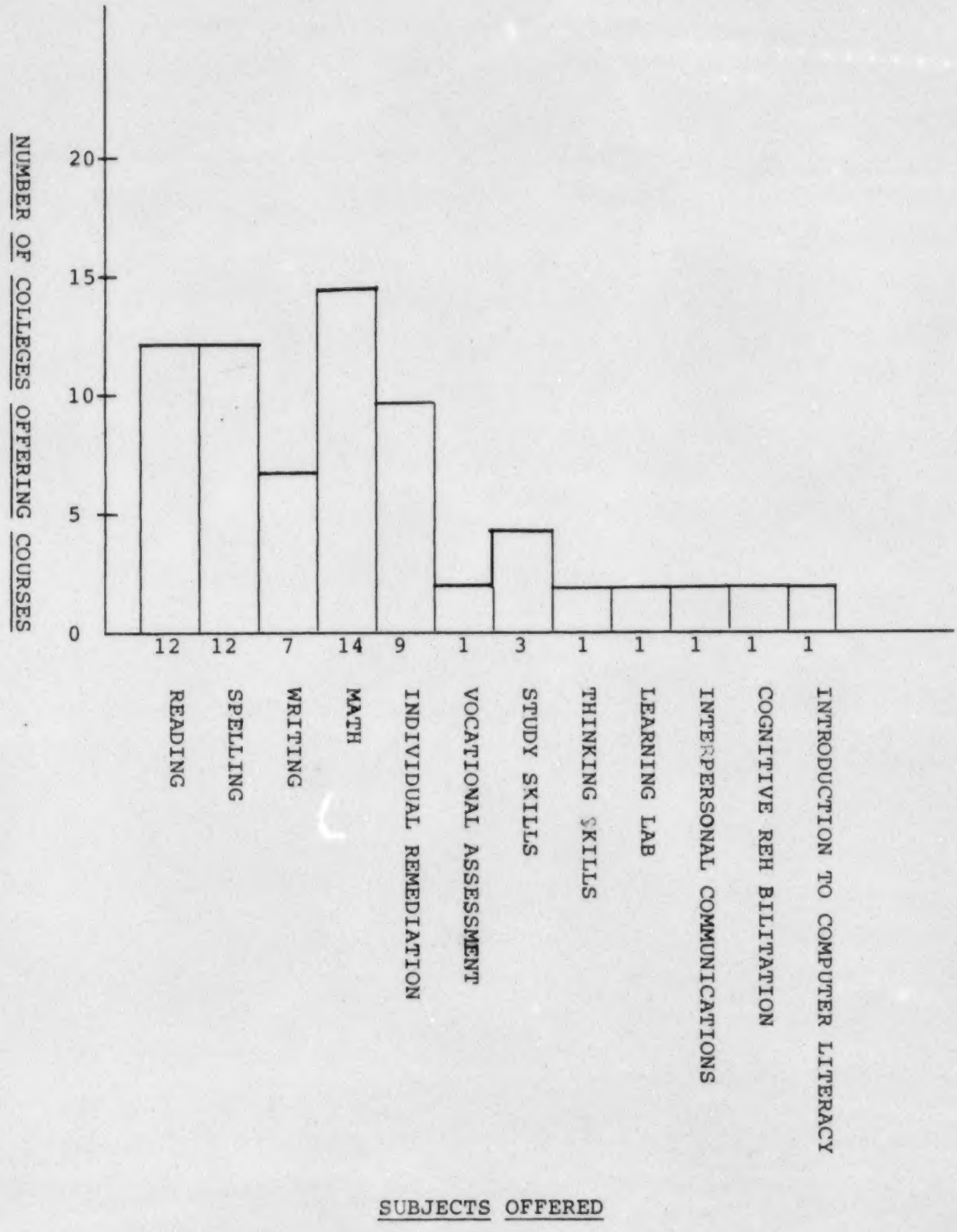
NUMBER OF COLLEGES OFFERING COURSES
0
5
10
15
20
12
12
7
14
9
1
3
1
1
1
1
1
READING
SPELLING
WRITING
MATH
INDIVIDUAL REMEDIATION
VOCATIONAL ASSESSMENT
STUDY SKILLS
THINKING SKILLS
LEARNING LAB
INTERPERSONAL COMMUNICATIONS
COGNITIVE REH BILITATION
INTRODUCTION TO COMPUTER LITERACY
SUBJECTS OFFERED

TABLE VI

Responses to Questions Concerning Assessment of Attitudes Towards Computer Assisted Instruction.

Questions	Frequency	Percent of Total Colleges
11. In your opinion, are students reacting favorably or unfavorably to the computer?	18	
Favorably	17	94
Indifferent	0	0
Unfavorably	1	1
12. In your opinion, are staff reacting favorably or unfavorably to the computer?	18	
Favorably	17	94
Indifferent	0	0
Unfavorably	1	6
13. What do you like about computer assisted courses for learning disabled adults?	18	
Like	18	100

- They are able to work at their own pace in a non-competitive environment.
- They are able to learn to use the computers and become familiar with a very current and popular technological phenomenon.
- Instant reinforcement.
- "Machine novelty" increases motivation
- Great as a motivator.
- It is patient and consistent.
- They are excellent to monitor drills.
- Good for repetitive tasks
- Saves tutor time and money
- Most student enjoy the change
- Independence
- Holds attention

TABLE VI - CONTINUED

Questions	Frequency	Percent of Total Colleges
- It is a viable supplement to an instructional intervention setting - Students usually react positively with the sophistication and electronic magic of computers - even though the program may be basic. Because it is presented on a computer, the student enjoys the electronic presentation. - Some programs are flexible. - Self-scoring. - Possibilities for individualization. - Computer is an extremely patient tutor, provides unlimited drill and practice. - Good software provides clear instruction in small increments. - Word processing programs reduce frustrations for writing exercises. - Students are turned on to the idea of working with a computer. - Benefits of positive and immediate feedback. - Students progress at their own speed and at appropriate level. - Attention held, especially by color screens. Strong student interest.		
	18	
Dislike	9	50
- Lack of software to deal with remedial student on adult level. - Computer programs are very specific in their directions, and this can be very frustrating for the student. - Need for better instructional software. - Need more software in English. - Few programs adequately breakdown learning tasks to provide a complete instructional program. - Lack of really good software - educational software is really lagging behind software development. Much of what is seen is nothing more than a worksheet programmed onto a disc. There is a lack of creativity, challenge, and the magic of what CAI is possible of doing. - Hard to find appropriate software. - Software boring - students not interested. - Untrained staff.		
14. Is there a need to have individual tutoring along with the self-paced computer courses? Why? Why not?	18	
Yes	17	94
No	0	0
N/A	1	6
*The one N/A was because they did not feel comfortable answering this question without further experience with the computers.		

TABLE VI - CONTINUED

Questions	Frequency	Percent of Total Colleges
14. Continued:		
Why?		
- The quality of instructional software at this time is not advanced enough to be used to the exclusion of other modes and materials.		
- Some students do not learn to use the computer effectively.		
- Depends upon the student		
- Many students need the reinforcement of the personal contact from tutoring.		
- Software programs are not sophisticated enough to provide one-to-one interaction necessary to teach skills to our students.		
- Computer reinforces, provides drill; no, or little instruction.		
- For personal monitoring and evaluation of effectiveness of CAI intervention.		
- Programs are not offered in all areas and not all modalities are utilized.		
- Enhances learning, we do not have entire courses computerized.		
- Most software isn't foolproof. There are always questions.		
- Student may not be able to handle the reading.		
- Depends on the student and reading level.		
- Need assistance with use of computer itself and understanding the programs, they are all so different.		
- To ensure the learning disabled adult is using the computer correctly.		
- When student is not comfortable using computer, or when student continues to make no progress while using the computer.		
15. Does your program expect to invest in more computers?		
Yes? No?	18	
Yes	16	89
No	2	11
Where do you anticipate funding to come from?		
- Community donations		

TABLE VI - CONTINUED

Questions	Frequency	Percent of Total Colleges
15. Continued:		
- Grants - Instructional Supplies Budget - Vocational Education Funding - AB77 Funding - HSP&S Funds (Handicapped Student Programs & Services) - Private donors (had printer donated this year by service club) - Don't know.		
16. Are you considering fees for these courses? Yes? No?	18	
Yes	5	28
No	13	72
How much?	5	
$1.00	1	20
$2.00 - $3.00	1	20
$3.00	2	40
NR	1	20
17. Do you have any additional comments/suggestions that you would like to add?		
- We are using an Apple II+ and off-the-shelf software in remedial math to supplement independent instruction in math.		
- I would like to see a process by which new software programs could be reviewed by individuals in the field and information regarding these programs could be disseminated to other colleges, this could save a lot of time.		
- Probably, but no time.		
- We anticipate having access to 20 computer stations with a wide variety of programs - I would be interested in assessment programs.		

TABLE VI - CONTINUED

17. Comments/suggestions continued from previous page:

- CAI is great for learning disabled students if used well. Provides incentive and constant reinforcement. Somewhat of a status symbol. It's a pain in the ass for untrained staff on a day-to-day basis, but it's worth it. Be sure to assign someone to learn all the little quirks.

- I would be interested in knowing what computer and software are being favored.

- We are just beginning the use of the computer and have just started to become familiar with software and what is available. I'll have a better idea about these things next year.

- There needs to be established a software network for Community College's Learning Disabilities Programs.

- An informational exchange would be helpful, particularly dealing with critiques of textbooks, software, etc. We currently use software from EISI (Milliken Math) and from SRA.

CHAPTER V

CONCLUSIONS

Statistics confirmed that in fact, computer assisted instruction with learning disabled adults in California Community Colleges is in its infancy stage. Only 18 out of the 107 colleges now have existing CAI programs in place.

The researcher's hypothesis stating that the need for computer assisted instruction with learning disabled adults would have significant favorable acceptance by the colleges instructors and students has been supported by the statistics which show that 94% of the students and staff reacted favorably to the computer; and that 100% of the colleges indicated that they liked CAI programs for LD adults.

Eighty-nine percent of the colleges indicated anticipating investing in additional computers and software. This statistic espoused the researcher's belief that California Community Colleges would reflect a positive attitude towards increasing their course content and offering and in positive attitudes towards CAI.

Lack of funding was indicated as being a major setback in the area of obtaining computers.

A reduction in staffing that the researcher felt would be established, was contraindicated This was significantly depicted by seventeen of the eighteen colleges stating that they felt that CAI needed to still have individual tutorial assistance. The human factor could not be ignored in the learning process.

Tutors were needed to instruct, guide and reinforce learning. The eighteenth respondent did not feel comfortable answering the question at this time without further experience with the computers.

Environmental conditions for the classrooms were changed by twenty-eight percent of the colleges to something less formal and non-threatening.

It was determined that the courses offered most often in CAI were Math, Reading, Spelling, Writing and Study Skills. Individual offerings were being attempted in Vocational Assessment, Thinking Skills, Learning Lab, Introduction to Computer Literacy, Cognitive Rehabilitation and Interpersonal Communications.

The major advantages to having CAI appeared to be:

- That students are able to work at their own pace in a non-competitive environment.
- They are able to learn to use the computers and become familiar with a very current and popular technological phenomenon.
- Instant reinforcement necessary for LD students.
- "Machine novelty" increases motivation.
- Good for repetitive tasks.
- Independence.
- Great for drills.

The major disadvantages to having CAI appeared to be:

- The entire area of software.
- Lack of software to deal with remedial student on adult level.
- Few programs adequately break down learning tasks to provide a complete instructional program.
- Untrained staff

Measurable reduction in staff was not in accordance with the researcher's hypothesis. In fact, research indicated that tutors were felt to be an important adjunct to CAI, for instruction, monitoring, explaining the programs and perhaps most importantly, to offer the human contact felt needed by the learning disabled students.

RECOMMENDATIONS

Results from this survey/questionnaire pointed to other areas that need to be addressed in the near future. Respondents indicated a need for an informational exchange, dealing with critiques of textbooks, software, etc.

Knowledge regarding the kinds of computers used and what software is favored was requested. This points to a whole study in itself.

The researcher feels that this is a wide-open field of untapped and valuable information that needs to be studied. Studies need to be done detailing the effectiveness or lack of, using the CAI with pre and post test ng.

REFERENCES

Bracey, Gerald W., Computers in Education - What the Research Shows. Electronic Learning, November/December 1982.

Brebner, A. & Hallworth, H.J., Development of Computer Assisted Instruction at VRRI. Research, Demonstration and Practice, Ten Years of Progress. Published by the Vocational and Rehabilitation Research Institute, 1979, pg. 91.

Cassidy-Bronson, Susan & Schiffman, Gilbert, EdD., & Tobin, Dianne. Personal Computers for the Learning Disabled - The State of the Art and the Problem. Journal of Learning Disabilities, Vol. 15, Number 7, August/September 1982, Pg. 422.

Chandler, Harry N., M.Ed. Tron, Taxpayers and Computers---Computers in the School. Journal of Learning Disabilities. Vol. 15, Number 8, October 1982, Pg. 495.

Fasteau, Steven R. Ed.D. "A Study of Managers of Special Programs and Services for the Handicapped in Public California Community Colleges." University of Southern California, 1979.

Fox, David J. The Research Process In Education. San Francisco Holt, Rinehart and Winston, Inc., 1969.

Gearheart, B.R., Learning Disabilities - Educational Strategies, The C.V. Mosby Company, Saint Louis, Missouri, 1973, pg. 138.

Kerlinger, Fred N. Foundations of Behavioral Research, New York: Holt, Rinehart and Winston, Inc., 1955, P. 397.

Kirk, Henry P. Ed.D. "Educational Programs for Physically Handicapped Students in California Community Colleges." University of Southern California, 1973.

Moyles, Laura C. & Newell, Jeanne. Microcomputers in a Postsecondary Curriculum. Academic Therapy, 1982

Peterson, Richard E., et al. Final Report, "Post-secondary Alternatives to Meet the Educational Needs of California Adults." Assembly Publications, Sacramento, September 1975, P. 38.

Sax, Gilbert. Empirical Foundations of Educational Research. New Jersey: Prentice-Hall, Inc. 1968.

Sellitti, Steven L., Ph.D., "A Study of Program Evaluation Procedures and Policies of Handicapped Programs and Services in California Community Colleges." United States International University, 1981.

Wresch, William. Computers in English Class: Finally Beyond Grammar and Spelling Drills. College English, Vol. 44, Number 5, September 1982, Pg. 483.

APPENDIX

DeAnza College 21250 Stevens Creek Blvd.
Cupertino, CA 95014

May 20, 1983

Dear Learning Disabilities Specialist:

I am taking a survey of all of the California Community College Learning Disability Programs. This three-page questionnaire will help me to assess the impact of computer assisted instruction as it relates to learning disabled adults in California Community Colleges.

This project is being undertaken because of the interest in providing timely information for Learning Disabilities Programs statewide, as sponsored by De Anza Community College.

Would you please take the time to complete the questionnaire, returning it to me in the enclosed self-addressed, stamped envelope by Friday, June 3, 1983.

If you would personally like to receive a copy of the study summary, please provide the information requested below, returning this letter with your questionnaire.

___ Yes, I would like to receive a copy of the study summary.

_____
Name

_____
Street Address

_____ CA _____
City Zip Code

Thank you in advance for your help in assisting me with this study. Your time and effort are greatly appreciated.

Sincerely,

Mary Jo Brower
C/O Richard F. Charles
Special Studies/PE
De Anza College
21250 Stevens Creek Blvd.
Cupertino, CA 95014

NOTE: Please return the questionnaire by FRIDAY, JUNE 3, 1983.

QUESTIONNAIRE

DIRECTIONS: PLEASE READ EACH QUESTION CAREFULLY AND COMPLETELY.

1. Does your college offer any classes or programs specifically to enhance the education of learning disabled adults using computers?

   Yes ___ No ___

2. Has your college offered, but discontinued in recent years, such classes or programs for learning disabled adults?

   Yes ___ No ___

3. Does your college have any classes or programs for learning disabled adults using computer assistance in the planning stage?

   Yes ___ No ___

4. Do you specifically select learning disabled adults for any advisory committee (s) for the use of computers?

   Yes ___ No ___

5. Do you have any administrative personnel or advisory committee specifically working and planning for computer assisted instruction?

   Yes ___ No ___

6. Do you cooperate with any other agency in the offering of classes or programs using computer assistance for learning disabled adults?

   Yes ___ No ___ Agency:_____

7. What means do you use to reach your area residents with a Schedule of Classes or similar listing of your offerings?

   _____

   _____

   _____

IF YOUR ANSWER WAS NO TO ALL OF THE FIRST SEVEN QUESTIONS, STOP HERE.

IF YOUR ANSWER WAS YES TO ANY OF THE FIRST SEVEN QUESTIONS, PLEASE COMPLETE ALL PARTS OF THE QUESTIONNAIRE.

8. Have you ever sent, or do you now send materials advertising your offerings in computers or the use of computers to assist students in the learning process?

   Yes ___ No ___

9. In these classes which provide computer assisted learning, have you made any effort to change the classroom to anything more informal or comfortable?

   Yes ___ No ___ Please describe:_____

   _____

Below are a number of courses geared especially to the needs of learning disabled adult . If you offer(ed) or will offer a course which is computer assisted and closely resembles any of these, please so indicate (X). Please answer other questions for each course so marked. Please add any courses you offer which are not included in this list.

INDICATE NUMBER OF DAYS OR WEEKS IF A SHORT COURSE.

NAME OF COURSE AND LEVEL ( ) (I.E., READING LEVEL:(1)	CURRENT OFFERING (HOW OFTEN)	PAST OFFERING (LAST DATE OFFERED)	FUTURE OFFERING (STARTING DATE)	ENROLLMENT (HEADCOUNTS IN CAI)	GRADED OR UNGRADED	UNITS OFFERED	REGULAR CLASSROOM	IF DISCONTINUED, REASON:
DIAGNOSTIC SCREENING ( )								
INDIVIDUAL REMEDIATION ( )								
READING ( )								
SPELLING ( )								
WRITING ( )								
MATH ( )								
STUDY SKILLS ( )								
INTERPERSONAL COMMUNICATIONS ( )								
OTHERS								
_____( )								
_____( )								
_____( )								
_____( )								

11. In your opinion, are students reacting favorably or unfavorably to the computer?

Favorably___ Indifferent___ Unfavorably ___

12. In your opinion, are staff reacting favorably or unfavorably to the computer?

Favorably___ Indifferent___ Unfavorably___

13. What do you like about computer assisted courses for learning disabled adults? What do you dislike?

_____

_____

_____

_____

14. Is there a need to have individual tutoring along with the self-paced computer courses? Why? Why not?

_____

_____

15. Does your program expect to invest in more computers? Yes___ No___. Where do you anticipate funding to come from?

_____

_____

16. Are you considering fees for these courses? Yes ___ No___. If so, how much?

_____

17. Do you have any additional comments/suggestions that you would like to add?

_____

_____

_____

_____

18. Your name:_____

Name of your College:_____

THANK YOU!

COLLEGES PARTICIPATING IN THE STUDY

ALAMEDA, COLLEGE OF
ALLAN HANCOCK COLLEGE
AMERICAN RIVER COLLEGE
ANTELOPE VALLEY COLLEGE
BAKERSFIELD COLLEGE
BARSTOW COLLEGE
BUTTE COLLEGE
CABRILLO COLLEGE
CANADA COLLEGE
CANYONS, COLLEGE OF
CERRITOS COLLEGE
CERRO COSO COLLEGE
CHABOT COLLEGE
CHAFFEY COLLEGE
CITRUS COLLEGE
COASTLINE COLLEGE
COLUMBIA COLLEGE
COMPTON COMMUNITY COLLEGE
CONTRA COSTA COLLEGE
CONSUMNES RIVER COLLEGE
CRAFTON HILLS COLLEGE
CUESTA COLLEGE
CUYAMACA COLLEGE
CYPRESS COLLEGE
DE ANZA COMMUNITY COLLEGE
DESERT, COLLEGE OF
DIABLO VALLEY COLLEGE
EAST LOS ANGELES COLLEGE
EL CAMINO COLLEGE
EVERGREEN COLLEGE
FEATHER RIVER COLLEGE
FOOTHILL COMMUNITY COLLEGE
FRESNO CITY COLLEGE
FULLERTON COLLEGE
GAVILAN COLLEGE
GLENDALE COMMUNITY COLLEGE
GOLDEN WEST COLLEGE
GROSSMONT COLLEGE
HARTNELL COLLEGE
IMPERIAL VALLEY COLLEGE
INDIAN RIVER COLLEGE
KINGS RIVER COLLEGE
LAKE TAHOE COMMUNITY COLLEGE
LANEY COLLEGE
LASSEN COLLEGE
LONG BEACH COLLEGE
LOS ANGELES CITY COLLEGE
LOS ANGELES HARBOE COLLEGE
LOS ANGELES METROPOLITAN COLLEGE
LOS ANGELES MISSION COLLEGE
LOS ANGELES PIERCE COLLEGE
LOS ANGELES SOUTHWEST COLLEGE
LOS ANGELES TRADE COLLEGE
LOS ANGELES VALLEY COLLEGE
LOS MEDANOS COLLEGE

COLLEGES PARTICIPATING IN STUDY - CONTINUED

COLLEGE OF MARIN
MENDOCINO COLLEGE
MERCED COLLEGE
MERRITT COLLEGE
MIRA COSTA COLLEGE
MISSION COLLEGE
MODESTO COLLEGE
MONTEREY PENINSULA COLLEGE
MOORPARK COLLEGE
MT. SAN ANTONIO COLLEGE
NT. SAN JACINTO COLLEGE
NAPA COLLEGE
OHLONE COLLEGE
ORANGE COAST COLLEGE
OXNARD COLLEGE
PALO VERDE COLLEGE
PALOMAR COLLEGE
PASADENA COLLEGE
PORTERVILLE COLLEGE
REDWOODS, COLLEGE OF
RIO HONDO COLLEGE
RIVERSIDE COLLEGE
SACRAMENTO CITY COLLEGE
SADDLEBACK COLLEGE
SAN BERNARDINO VALLEY
SAN DIEGO CITY
SAN DIEGO EDUCATIONAL CULTURAL COMPLEX
SAN DIEGO MESA COLLEGE
SAN DIEGO MIRAMAR
SAN FRANCISCO CITY COLLEGE
SAN JOAQUIN DELTA COLLEGE
SAN JOSE CITY COLLEGE
SAN MATEO COLLEGE
SANTA ANA COLLEGE
SANAT BARBARA CITY COLLEGE
SANTA MONICA COLLEGE
SANTA ROSA JUNIOR COLLEGE
SEQUOIAS,COLLEGE OF
SHASTA COLLEGE
SIERRA COLLEGE
SISKIYOUS, COLLEGE OF
SKYLINE COLLEGE
SOLANO COLLEGE
SOUTHWESTERN COLLEGE
TAFT COLLEGE
VENTURA COLLEGE
VICTOR VALLEY COLLEGE
VISTA COLLEGE
WEST HILLS COLLEGE
WEST LOS ANGELES COLLEGE
WEST VALLEY COLLEGE
YUBA COLLEGE

ERIC Clearinghouse for Junior Colleges
8118 Math-Sciences Building
University of California
Los Angeles, California 90024
FEB 17 1984